

What is claimed:

1. A method of increasing the production of starch in plants comprising culturing a plant with enhanced expression or activity of at least one starch biosynthesis enhancing protein.
2. The method of claim 1, wherein said starch has a high amylose content.
3. The method as claimed in either claim 1 or 2, wherein production of amylose is increased.
4. The method as claimed in any one of claims 1 to 3, wherein said method comprises over-expression of a starch biosynthesis enhancing protein.
5. The method as claimed in claim 4, wherein said protein comprises the SEQ ID NO: 2 or 4 or a protein derived from this sequence by substitution, insertion or deletion of amino acids and which has at least 50% identity at the amino acid level with SEQ ID NO: 2 or 4.
6. The method as claimed in any of claims 1 to 5, wherein the starch biosynthesis enhancing protein is encoded by a nucleic acid sequence selected from the group consisting of:
  - a) a nucleic acid sequence comprising a nucleotide sequence which is at least 60% identical to the nucleic acid sequence of SEQ ID NO: 1 or 3;
  - b) a nucleic acid sequence comprising a fragment of at least 30 nucleotides of a nucleic acid sequence comprising the nucleotide sequence of SEQ ID NO:1 or 3;
  - c) a nucleic acid sequence which encodes a polypeptide comprising an amino acid sequence at least about 60% identical to the amino acid sequence of SEQ ID NO:2 or 4 and
  - d) a nucleic acid sequence which encodes a fragment of a polypeptide comprising the amino acid sequence of SEQ ID NO: 2 or 4 or wherein the fragment comprises at least 10 contiguous amino acid residues of the amino acid sequence of SEQ ID NO:2 or 4,

7. The method as claimed in any one of claims 1 to 6, wherein the starch biosynthesis enhancing protein is encoded by a nucleic acid sequence comprising the nucleotide sequence set forth as SEQ ID NO:1 or SEQ ID NO:3.
- 5 8. The method as claimed in any one of claims 1 to 7, wherein deficiency or decreased activity is achieved by a method selected from the group consisting of:
- 10 a) knock-out of the gene encoding said protein;
- b) mutagenesis of the gene encoding said protein, wherein said mutation can be induced in the coding, non-coding, or regulatory regions of said gene;
- 15 c) expression of an anti-sense RNA, wherein said anti-sense RNA is complementary to at least part of the RNA encoding said protein;
9. A method of producing amylose type starch by culturing a plant which over-expresses SEQ ID NO:1 or 3 or has increased starch biosynthesis enhancing activity under conditions such that the plant produces an increased amount of amylose type starch.
- 20 10. The method of any of the preceeding claims, wherein said plant belongs to the genus *Solanum*.
- 25 11. The method of claim 10, wherein said plant is *Solanum tuberosum*.
12. A nucleic acid sequence SEQ ID NO:1 encoding a starch biosynthesis enhancing protein.
- 30 13. A nucleic acid sequence SEQ ID NO:3 encoding a starch biosynthesis enhancing protein.
14. An amino acid sequence SEQ ID NO:2 having starch biosynthesis enhancing activity.
- 35 15. An amino acid sequence SEQ ID NO:4 having starch biosynthesis enhancing activity.

16. A transgenic expression cassette comprising in combination with a regulatory sequence a nucleic acid sequence selected from the group consisting of:

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- a) a nucleic acid sequence comprising a nucleotide sequence which is at least 60% identical to the nucleotide sequence of SEQ ID NO:1 or SEQ ID NO:3,
- b) a nucleic acid sequence comprising a fragment of at least 30 nucleotides of a nucleic acid sequence comprising the nucleotide sequence of SEQ ID NO:1 or SEQ ID NO:3,
- 10 c) a nucleic acid sequence which encodes a polypeptide comprising an amino acid sequence at least about 60% identical to the amino acid sequence of SEQ ID NO:2 or SEQ ID NO:4, or
- d) a nucleic acid sequence which encodes a fragment of a polypeptide comprising the amino acid sequence of SEQ ID NO:2 or SEQ ID NO:4 wherein the fragment comprises at least 10 contiguous amino acid residues of the amino acid sequence of SEQ ID NO:2 or SEQ ID NO:4
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wherein said regulatory sequence is capable of mediating expression of said nucleic acid sequence in a plant.

20 17. A transgenic expression cassette of claim 16, wherein said regulatory sequence is a promoter sequence heterologous with regard to said nucleic acid sequence.

25 18. A transgenic expression cassette of claim 16, wherein said regulatory sequence is a tuber specific promoter sequence.

30 19. A transgenic expression cassette of either claim 16, 17 or 18, wherein said nucleic acid sequence is arranged in antisense or sense orientation with regard to said promoter sequence.

20. A transgenic expression cassette of any of the claims 16 to 19, wherein said nucleic acid sequence encodes a polypeptide comprising the amino acid sequence set forth in SEQ ID NO:2 or SEQ ID NO:4.

35 21. A transgenic expression cassette of any of the claims 16 to 20, wherein said nucleic acid molecule comprises the nucleotide sequence set forth in SEQ ID NO:1 or SEQ ID NO:3.

22. A transgenic expression cassette of any of the claims 16 to 21, wherein said nucleic acid sequence encodes a naturally occurring variant of a polypeptide comprising the amino acid sequence set forth in SEQ ID NO:2 or SEQ ID NO:4.
- 5 23. A transgenic host cell transformed with an expression cassette of any of the claims 16 to 22.
24. A transgenic host cell of claim 23, wherein said host cell belongs to the genus *Solanum*.
- 10 25. A transgenic plant comprising an expression cassette of any of claims 16 to 22.
26. A transgenic potato plant comprising an expression cassette of any of claims 16 to 22.
- 15 27. A transgenic potato plant, plant part, seed or tuber comprising an expression cassette of any of claims 16 to 22.